

Owners Manual

RANGER™

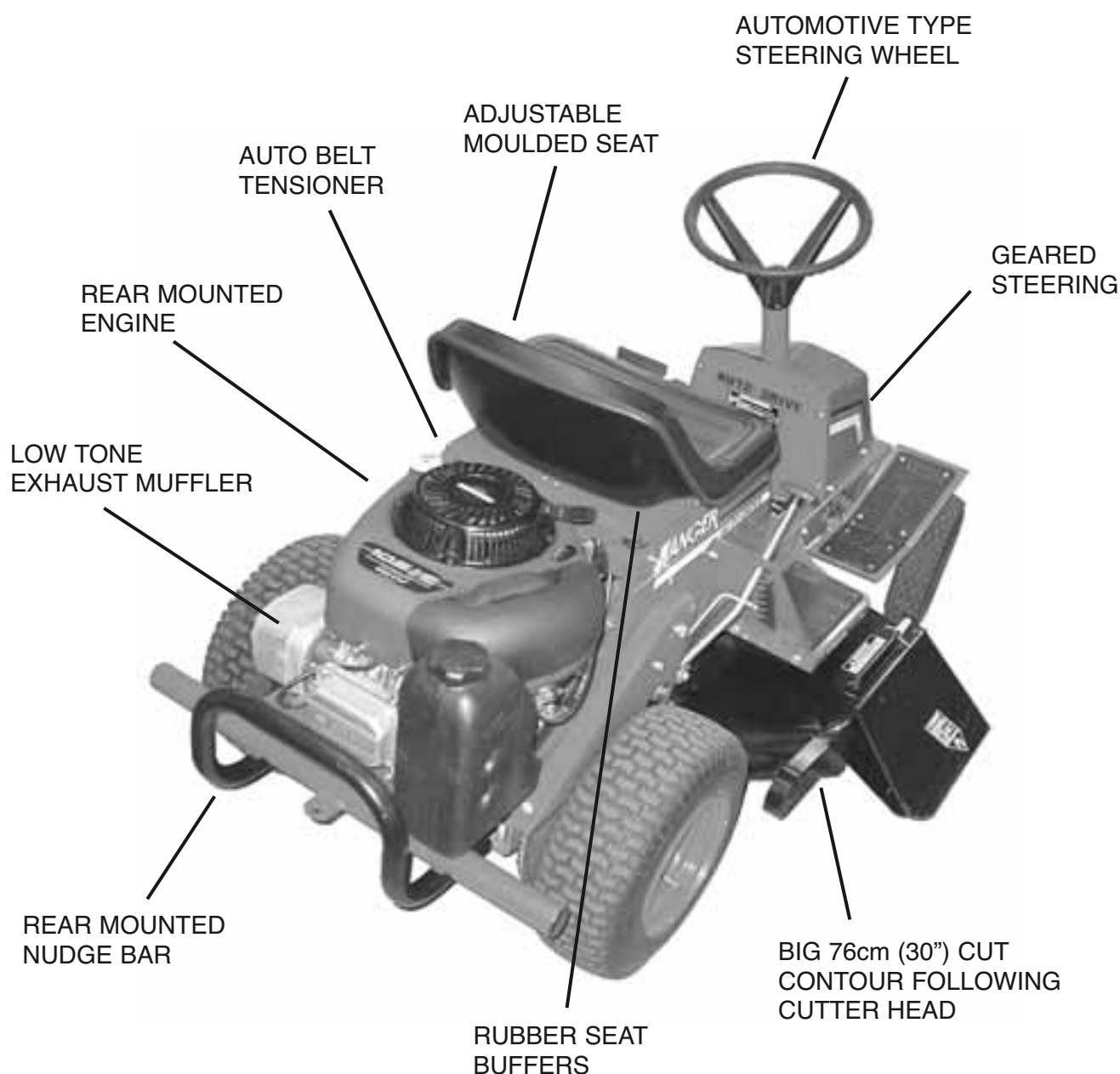
AUTO-DRIVE


Model No. 53179



SAFETY FEATURES

- Traction drive, blade drive and safety interlock
- Enclosed drives
- Full footrests
- Low centre of gravity, stable wide track
- Parking brake
- Convenient - easy to operate controls



	WARNING
	<p>“If fitted with accessories, including any authorised ROVER accessories such as a Grass Catcher, this mower may not comply with AS 3792.1.”</p>

SPECIFICATIONS

ROVER RANGER

Model No	53179
Engine Make	Briggs & Stratton
Engine Model No.	215907
Engine Power	10.5 Hp.
Fuel Capacity	2.27 Litres
Oil Capacity	1.4 Litres (no filter)
Spark Plug Type	Champion RC12YC
Spark Plug Gap	0.7 to 0.8mm
Engine Oil	Refer to manufacturers instructions

TRANSMISSION

Auto-Drive system consists of a continuous belt being driven by the engine pulley over two drive pulleys and around a return pulley. Friction plates are brought into contact with the drive pulleys to impart either forward or reverse motion to the rear drive wheels by means of a drive selector pedal on the right side of the machine.

Ground speed at 3600 rpm is variable due to the Auto-Drive system depending on pressure applied to the drive selector pedal.

Max. Speed = 8.6km/hr

CUTTING HEAD

Model 160 Full floating pressed steel housing with right side discharge. Width of cut 760mm (30").

TYRES

Front Tyres-	4.1 x 6 Tube Pressure 140 Kpa maximum. (20psi)
Rear Tyres-	16 x 6.5 x 8 Tubeless Pressure 96 Kpa maximum. (14psi)

CONTROLS

- * Throttle control with Fast, Slow and Choke positions.
- * Key switch with OFF, ON and START positions.

STEERING WHEEL

325 mm Dia. Steering Wheel.
1 - 1/4turns lock to lock.

CLUTCH/ BRAKE PEDAL

Foot operated pedal. Left side of machine.

PARKING BRAKE KNOB

Hand operated catch. Left hand side.
Used in conjunction with clutch/brake pedal.

DRIVE SELECTOR

Foot operated pedal located on right side of the machine.
Spring loaded so as to return to neutral position.

CUTTING HEIGHT

Lever right hand side.
8 height of cut positions from 15mm to 65mm.


CUTTER DRIVE


Lever located left side of seat cowl.

GENERAL

Wheel Base	1.35m	Length	1.64m
Track	0.63m R 0.69m F	Width	0.80m
Turning Circle	5.8m	Height	0.95m
Turning Radius	2.0m	Weight	195kg

To emphasise special information the words **WARNING** and **CAUTION** are used.

WARNING	
	The safety of the user and others involved. Personal injury may result should this information be disregarded.

CAUTION	
	Follow these instructions carefully to avoid mower damage and loss of warranty.

LOOSE PARTS KIT

DESCRIPTION	QTY	USE
Steering wheel	1	On steering shaft
Roll Pin	1	Secure steering wheel to shaft
Stone guard assembly	1	Fitted to cutterhead
Spring stone guard	1	On stone guard pivot rod
“E” Clip	1	In groove in pivot rod
Ignition keys	2	To start machine
Plug spanner	1	Plug removal and fitting
Pop Rivets	2	Seat safety switch

SETTING UP INSTRUCTIONS

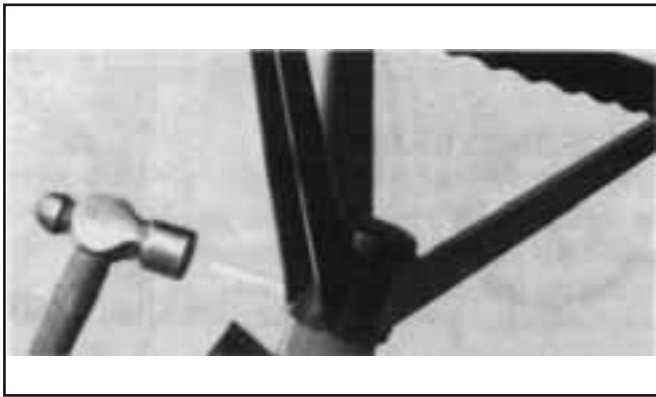


Fig. 2

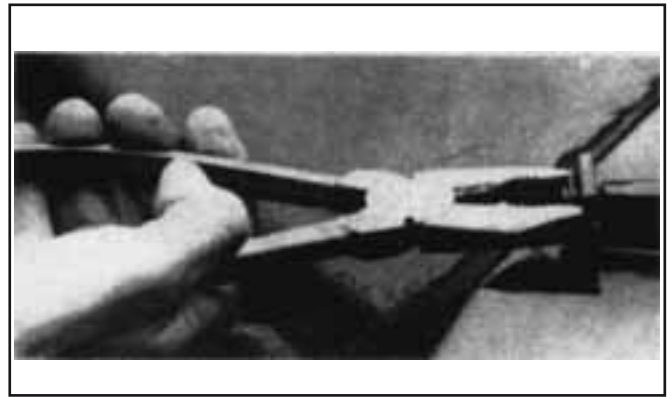


Fig. 4

INSTALLING STEERING WHEEL

1. Slip the steering wheel over the steering shaft and align the wheel hole with the shaft hole.
2. Insert a drift punch – partially through the holes to maintain alignment and insert the roll pin in the opposite side. *Fig. 2*
3. Drive the roll pin in until flush with the outside of the wheel.




Fig. 3

INSTALLING STONE GUARD

1. Slip the spring into the stone guard pivot rod so that the short leg rests on top of the stone guard.
2. Now twist the spring as shown and feed the end of the pivot rod into the forward pivot bracket. *Fig 3.*
3. Insert the short end of the pivot rod fully into the rearward pivot bracket.
4. Release the spring. It should spring down onto the top of the cutterhead and be tensioning the stone guard down.
5. Secure by clipping the “E” Clip into the groove on the pivot rod. *Fig. 4.*

INSTALLING THE BATTERY

1. Remove the battery as follows
 - (a) remove the terminal cables from the battery.
 - (b) undo the wingnuts and remove the clamp bar.
2. The battery is not filled with Electrolyte. This should be done by adding 33% strength battery acid to each cell until the plates are covered. Electrolyte must be purchased from a local battery supply outlet.

	CAUTION
	Do not overfill battery, acid will overflow into other parts of the machine and severe corrosion and deterioration will result.


3. Leave the filler caps off and connect the battery charger to the battery terminals. Charge the battery at 4 Amps/Hour for a minimum of 6 hours.
4. After charging, check that the Electrolyte is still covering the plates, if not, add to the correct level. Install the filler caps.
5. Replace the battery and secure.
6. Install the positive (red) cable to the positive (+) terminal and the negative (black) cable to the negative (-) battery terminal. Secure for good electrical contact.

BEFORE OPERATING

FILL CRANK CASE WITH OIL


The rider mower may be delivered without oil in the crankcase. Oil must be added before attempting to start the engine.

1. Place the machine on level surface. Ensure that the oil plug is securely tightened. Clean around the dipstick.
2. Unscrew and remove the dipstick from the oil filler tube.
3. Insert a funnel into the filler tube and slowly add oil in accordance with the engine manufacturer's direction.
4. Ensure oil level is at the full mark on the dipstick when screwed completely in. When finished, replace the dipstick and re-tighten.

	CAUTION
	Avoid premature engine failure by ensuring the funnel is clean so contaminants are not introduced into the crankcase. Wipe any oil spills so it will not cause dirt to collect on the engine.

FILL FUEL TANK

Refer Safety Instructions.

	CAUTION
	Use only unleaded petrol. Do not mix oil with petrol – engine damage may result.

1. Clean around the fuel tank cap so foreign matter cannot enter the tank when the cap is removed.
2. Using a funnel, fill the tank with unleaded petrol. Replace the cap.
3. Wipe up any petrol that may have spilled.

CHECK TYRE PRESSURE

Check and maintain tyre pressure at 140 KPA (20PSI) front and 96 KPA (14PSI) rear maximum.

ADJUSTING THE SEAT

Tip the seat forward, loosen the seat securing screws. Relocate the seat for operator comfort. Tighten the seat securing screws and lower the seat. *Fig 5.*



Fig. 5

CONTROLS

1. THROTTLE CONTROL

Mounted on the control panel and connected to the engine carburettor controls. Has the symbols for Slow, Fast and Choke. *Fig. 6*

2. IGNITION SWITCH

This switch is part of the battery ignition system and has three positions marked for Off, On and Start. The switch is key operated and automatically returns to the On position from the Start position when released. *Fig. 6*

3. BRAKE/ CLUTCH

Foot operated pedal on the left side of machine. Depressing the pedal neutralises the drive belt and engages the Brake Disc. *Fig. 7*

4. PARKING BRAKE

Hand operated knob left hand side. Depressing the brake/clutch foot pedal enables this knob to be engaged and disengaged. Brake is locked on with knob in up position. *Fig. 7*

5. DRIVE SELECTION

Foot operated right hand side. Depress with toe pressure gives forward motion, depress with heel gives reverse motion. Automatically returns to neutral position when foot is removed. *Fig. 7*

6. CUTTING HEIGHT ADJUSTER

Located on right side of seat. (*Fig. 7*) with low cut at bottom and high cut at the top setting. *Fig.7*

7. CUTTER DRIVE

Lever located on left hand side of seat mounting box. Down position disengages blade drive and applies blade brake, up position engages blades. *Fig. 7*

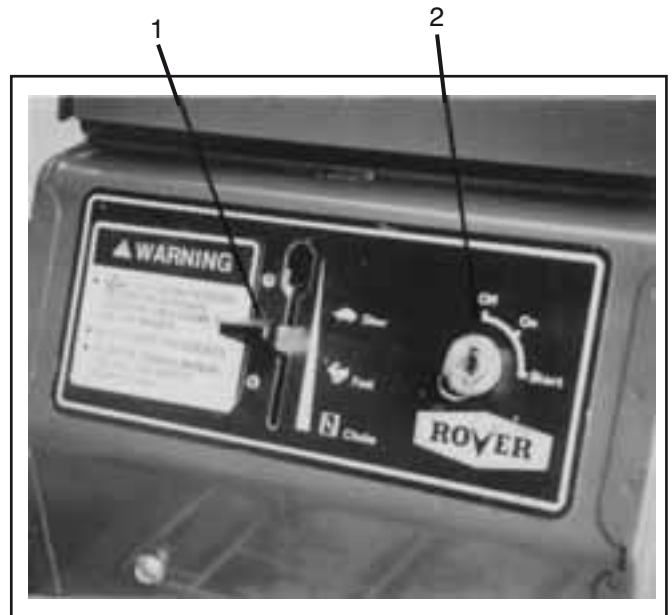


Fig. 6

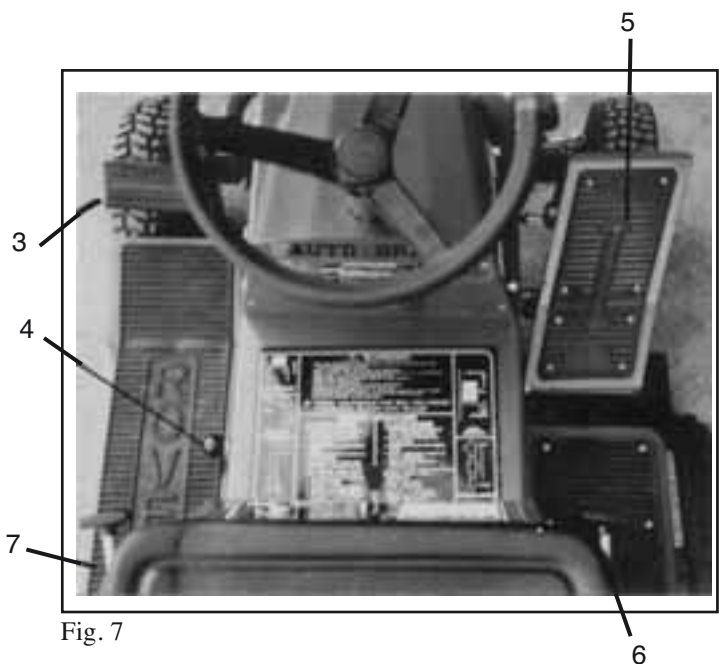


Fig. 7

OPERATING INSTRUCTIONS

AUTO - DRIVE OPERATION

Forward and reverse movement of the mower is controlled by the drive selector pedal. Ground speed of the ride-on mower is controlled by the amount of pressure on the drive selector pedal. Ensure that the mower user is familiar with this means of operation before operating the mower, particularly in tight confined areas.

TO START ENGINE

NOTE:

The engine will not start unless the cutter drive is disengaged, and clutch/brake pedal is depressed and parking brake applied.

1. Depress clutch/brake pedal – Apply the parking brake.
2. Move the drive selector to neutral.
3. Disengage the cutter drive.
4. Move the throttle lever to the choke position.
5. Turn the ignition key to the start position and release when the engine starts.
6. Move the throttle lever to about 1/4 position.

TO MOW OR DRIVE

1. Depress clutch/brake pedal.
2. Disengage the parking brake.
3. Select height of cut.
4. Move throttle to about 3/4 position.
5. Engage cutter drive.
6. Select desired drive.
7. Slowly release clutch/brake pedal and move off.

TO STOP ENGINE

1. Depress clutch/brake pedal.
2. Shift the drive selector to neutral.
3. Disengage the cutter drive.
4. Apply the parking brake.
5. Move throttle lever to the fast position.
6. Turn the ignition key to Off. Remove the keys.

TO STOP IN AN EMERGENCY

1. Depress brake/clutch pedal and drive selector pedal together. (This disengages power from the engine and engages the disc brake.)
2. Apply park brake and lock.
3. Move throttle to fast position and switch off ignition key.
4. Dismount from the mower if it is safe to do so.



WARNING

To avoid loss of control always come to a complete stop before changing drive direction and slow down before turning.

	WARNING
	The parking brake should always be applied before leaving the machine. The parking brake must be released before attempting to drive. Depress the clutch/brake when starting or coming to a rest. Do not use sudden directional reversal which can cause wheel spinning.

ENGAGE CLUTCHES

When engaging the cutter drive lever or releasing the clutch/brake pedal, always operate slowly. Do not use a jerking motion. Moving these controls too fast could possibly overload and stall the engine.

REMEMBER

1. Always look behind the machine before reversing.
2. Do not refuel when the engine is running or while the engine is hot.
3. Keep bystanders away – Keep hands and feet clear of moving parts.
4. Keep the machine clean of grass and debris.
5. Keep all safety devices (guards and switches) in place and working.

	CAUTION
	A check after the first two hours of operation is recommended. Engine failure or rapid engine wear mainly results from the following causes –

6. Dirt or abrasives entering the engine via the air cleaner due to –
 - (a) The air cleaner element not being serviced regularly, or
 - (b) The air cleaner damaged or dislodged.

7. Dirt or abrasives entering the engine via the oil filler tube due to-
 - (a) Using a funnel not cleaned of dirt or grit, or,
 - (b) Topping up with contaminated oil stored in an unclean container.
8. Lack of oil. It is important to-
 - (a) Check the oil level regularly (Every 5 hours of operation)
 - (b) Maintain a full sump.

Periodically check the machine and the cutting mechanism. If parts are worn or need replacing do so by using only Genuine Rover Replacement parts.

Before working on the mower, disconnect the spark plug lead from the spark plug and place it where it cannot contact the spark plug.

Check your **Rover Ranger** frequently for loose nuts, bolts, belts, etc., and keep these items correctly tightened and adjusted.


AIR CLEANER

Refer to engine manufacturer's manual for detailed instructions.

1. Pull up on air cleaner cover handle and rotate towards engine.
2. Remove air cleaner cover.
3. Carefully lift air cleaner cartridge and pre-cleaner from blower housing.

Note: To clean pre-cleaner, wash in soapy water. Squeeze dry in a clean cloth. **DO NOT OIL.**

4. Tap the air cleaner on a flat surface to dislodge any loose debris. If contaminated, replace.
5. Clean the base of the air cleaner cartridge area **carefully** to prevent any debris from entering engine.
6. Place the air cleaner pre-cleaner and cartridge into the blower housing. The cartridge must fit securely in base.
7. Align the tabs on the cover with the slots in the blower housing and replace the cover.
8. Hook the handle and close the cover.

	CAUTION
	<p>Petroleum solvents, such as kerosene, are not to be used to clean cartridge. They may cause deterioration of the cartridge. DO NOT OIL CARTRIDGE. DO NOT USE PRESSURIZED AIR TO CLEAN OR DRY CARTRIDGE.</p>

MAINTENANCE

OIL CHANGE

Refer engine manufacturers' instructions.

1. Place the machine on a level surface. Start and run the engine for a period to warm the oil.



Fig. 8

2. Fit the drain tube to the drain fitting. *Fig. 8*
3. Place an oil pan under the end of drain tube.
4. Open the drain fitting about 1 turn and allow the oil to drain completely.
5. Retighten the drain fitting and refill the sump with new oil. For correct viscosity and service classification, refer to the engine manufacturers' instructions.

SPARK PLUG

The spark plug gap gradually increases during engine running and should be checked periodically and whenever the engine malfunctions.

1. Clean around the spark plug area so that dirt will not enter the engine when the spark plug is removed.
2. Disconnect the spark plug lead and remove the spark plug.
3. Check the condition of electrodes and ensure there is no damage to insulator.
4. Carefully clean the spark plug. Do not grit blast.
5. Set the gap between 0.7mm to 0.8mm.
6. Install the spark plug in the engine and tighten.

COOLING SYSTEM

The Ranger has an air cooled 4 stroke engine. It must be cleared frequently. Remove any build up of grass, dirt or other debris from the

1. Cylinder
2. Cylinder head cooling fins
3. Cooling air intake screen
4. Carburettor governor levers and linkages.

This will ensure adequate cooling and correct engine speed.

THROTTLE CONTROL

Proper choke operation is dependant on the adjustment of remote controls –

1. Loosen the outer cable clamp screw on engine.
2. Set the throttle control to choke position.
3. Adjust the outer cable under clamp plate so that choke is operated.
4. Tighten the clamp plate screw and check
 - (a) Choke does not operate in fast position,
 - (b) Stop switch operates correctly.

CARBURETTOR ADJUSTMENT

The carburettor has been factory set and should only require occasional fine tuning.

Refer to Engine Manufacturer's Owner's Manual for details adjustment procedures.

	CAUTION
	Never tamper with the engine governor setting. Changing of engine governor speed will void engine warranty.

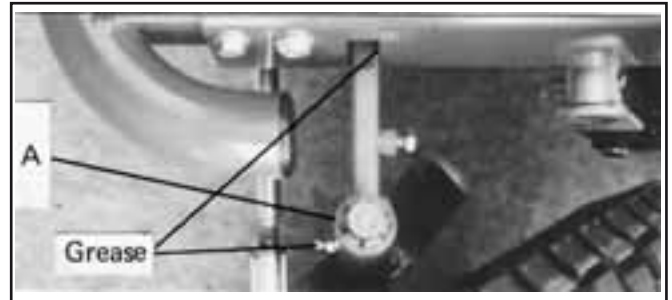


Fig. 11

LUBRICATION GENERAL

Using General Purpose Grease – (Every 25 hours)

Grease nipples on front wheel pivots. *Fig. 11*

Cam plate bearing area. *Fig. 26*

Front Axle beam guides.

Grease nipples on steering pivot blocks. *Fig. 21*

Steering gears. *Fig. 21*

Grease nipples on engagement lever pivot.

Steering pivot blocks. *Fig. 23*

Using Clean Engine Oil –

Jockey pivot arms

Throttle control cable.

Drive Chain. *Fig. 23*

Cutter drive lever pivot.

Clutch/Brake pedal pivot. *Fig. 15*

Tie rod ball ends. *Fig. 11*

All connecting rod pivots points.

NOTE:

All ball bearings are sealed and require no maintenance.

MAINTENANCE

CUTTING UNIT

Remove spark plug lead and disengage cutter drive before working on cutter unit, to prevent accidental starting of the engine.

Before using the machine always inspect cutting unit to ensure that the cutting disc, blades and blade fittings are not worn or damaged.

Always check after striking a solid object. Do not operate machine when unusual vibration occurs.

Replace worn or damaged blades in sets to preserve balance.

Remove any build-up of grass or clogging within the cutting unit, discharge chute or stone guard.

CUTTERHEAD REMOVAL

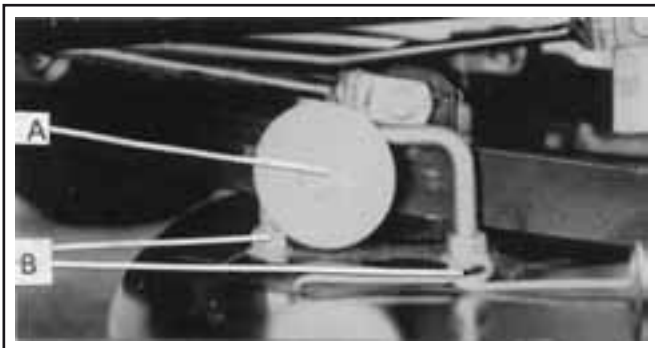


Fig. 12

1. Disconnect push rods & brake rod. *Fig. 12*
2. Remove the tensioning spring. A loop has been provided on the spring to assist in this operation. *Fig. 12*
3. Slide cutterback towards back of machine and remove belt from around cutterdeck pulley.
4. Undo large retaining washer bolts (A) *Fig. 12* This will allow front of deck to be lowered to ground.
5. Slide cutterdeck forward. This will allow the rear to be lowered to the ground and be slid from under the machine.
6. Replace in reverse order.

NOTE:

To remove cutterdeck belt from machine, the belt guard has to be moved away from the drive pulley to allow the belt to be removed from the V-groove and the cutterhead lifting rod is to be disengaged from the cutterhead selection arm assembly to allow belt to be drawn out.

WHEEL REMOVAL



Fig. 13

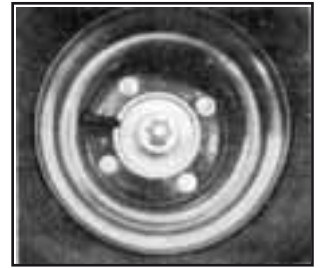


Fig. 14



WARNING

Always deflate tyre before moving rim nuts on front wheel only.

Front –

1. Chock the rear wheels and remove the front axle nut. *Fig. 13*
2. Raise the front of the machine.
3. Slide the wheel from the shaft.
4. Replace in reverse order.
5. Re-tighten the axle nut firmly.

Rear –

1. Chock the front wheels and raise the rear of the machine.
2. Remove the four wheel nuts.
3. Slide the wheel from the hub. *Fig. 14*
4. Refit the wheel to hub.
5. Replace the wheel nuts and tighten.

BRAKE CALIPER ADJUSTMENT

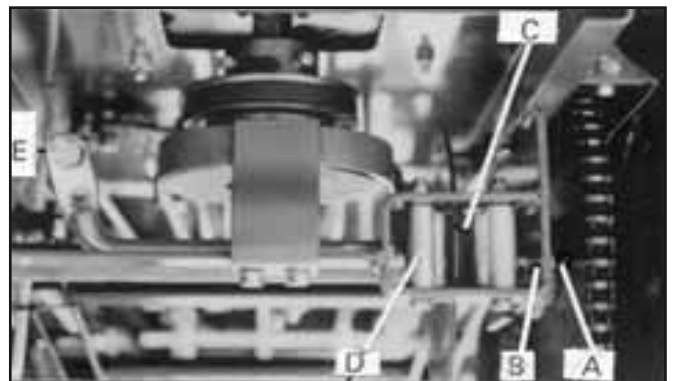


Fig. 15

1. Loosen locknut 'A' *Fig. 15*
2. Adjust Bolt 'B' till brake calliper 'C' touches brake Disc.
3. Re-tighten locknut 'A'.

BRAKE ARM ADJUSTMENT

1. Check that brake calliper is correctly adjusted.
2. Adjust locknut 'E' *Fig. 15*. Till brake arm 'D' Pad comes into contact with disc.
3. Check operation of brake to ensure park brake can be applied, and brake operates correctly.

MAINTENANCE

PARKING BRAKE

Should always be checked for operation after clutch/brake rods have been adjusted.

CUTTER DRIVE ADJUSTMENT

1. Move cutter Height Selector Lever to No. 4 Position in Rack.
2. Move cutter Drive Lever to the Engaged position.
3. Adjust Push Rods *Fig. 16* to give a spring compression of 35mm. *Fig. 17*

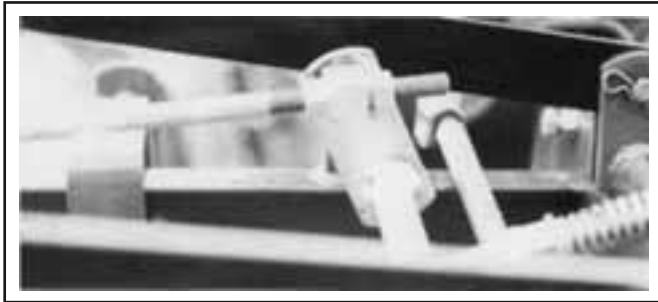


Fig. 16

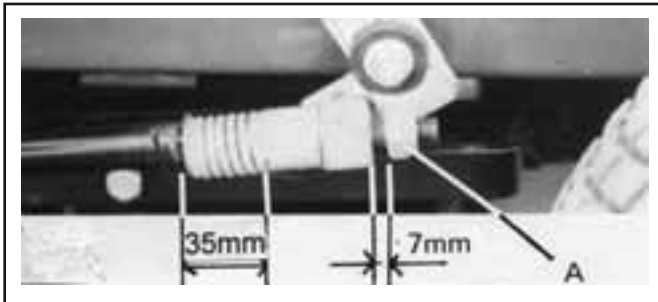


Fig. 17

4. Adjust Locknut 'A' to give 7mm clearance to back of Swivel Block. *Fig. 17*
5. Disengage the Cutter Drive Selector Lever.
6. Adjust locknut 'A' in *Fig. 20* to give Cutter Engagement Lever a free travel of 30mm, from bottom of slot in *Fig. 18*

NOTE:

Check to ensure lever has 30mm of free travel by working lever.



Fig. 18

CUTTERHEAD BRAKE

Should be regularly checked for operation.

PAD REPLACEMENT

(Refer figure 19)

1. Remove the 'R' Clip (A) from the push rod clevis pin and remove the clevis pin and push rod from brake arm assembly.
2. Remove the brake plate pivot bolt (B), two spacers and nyloc nut and remove the brake plate assembly.
3. Drill out the two retaining rivets which hold the Brake pad assembly to the brake plate and discard the old brake pad and backing plate. The replacement brake pads are fitted with a chemically bonded backing plate, locate this backing plate against the brake plate and retain with two 3/16" rivets. Part No: A2901195.
4. Replace the brake plate to the cutterhead and adjust the cutterhead brake.

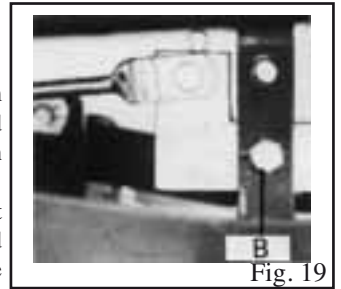


Fig. 19

CUTTERHEAD BRAKE ADJUSTMENT

1. With the cutterhead disengaged and in low cut position.
2. Adjust the nyloc nut on the rod as per step 6 for Cutter Drive Adjustment.
3. Adjust the tension on the spring using the lock nuts to give length of 58mm. *Fig. 20*

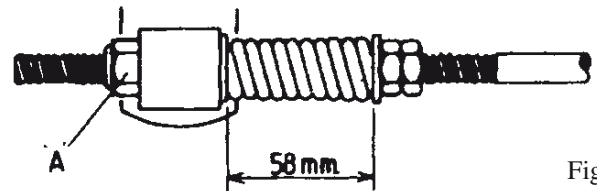


Fig. 20

STEERING GEARS

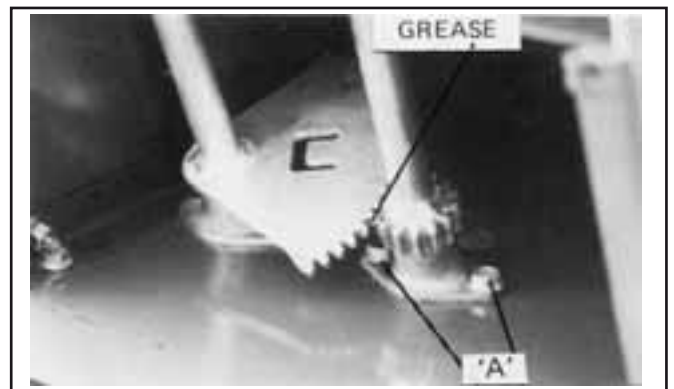


Fig. 21

To adjust the excessive play caused by wear in the gears.

1. Loosen the bolts securing steering shaft pivot block (A)
2. Lightly tap the pivot block towards the layshaft pivot and retighten bolts (A)
3. Check the steering gear engagement.
4. Check that there is no tight spots when turning the steering wheel from lock to lock.

MAINTENANCE

AUTO-DRIVE

The Auto-Drive friction plates and drive pulleys are factory set for travel required along a keyed shaft and this should not need adjusting.

If during operation it is found that the relationship between forward and reverse has become unbalanced adjust as follow:-

1. Loosen Locknut (A) *Fig. 22*
2. Centralise engagement lever with the friction plates between the drive pulleys.
3. Re-tighten locknut (A). *Fig. 22*

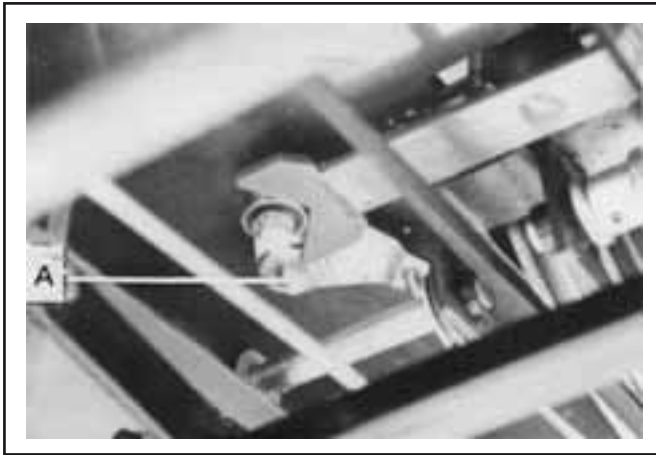


Fig. 22

DRIVE CHAIN ADJUSTMENT

Primary

1. Loosen off bolt 'A' *Fig. 23*
2. Slide idler back till chain tightens.
3. Re-tighten bolt 'A' and check chain for tight spots.

Secondary

1. Loosen off bolt 'B' *Fig. 23*
2. Slide sprocket back till chain tightens.
3. Re-tighten bolt 'B' and check chain for tight spots.

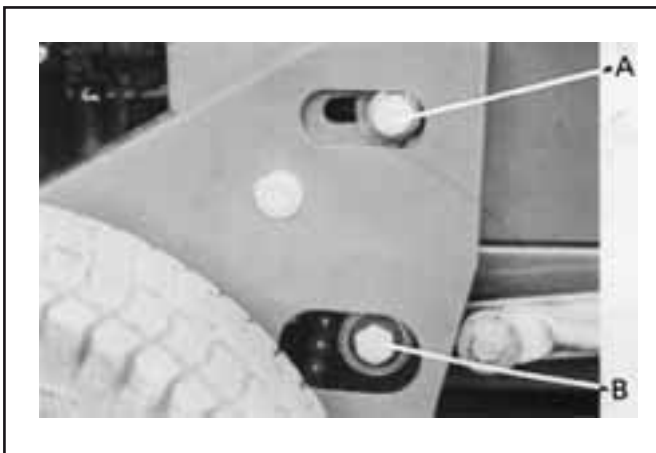


Fig. 23

DRIVE SELECTOR PEDAL

The pedal angle can be tilted either forward or back to suit individual requirements if necessary.

1. Loosen locknuts (A) on control rod. *Fig. 24*
2. Tilt control pedal to required angle to give maximum operator comfort.
3. Re-tighten locknuts.



Fig. 24



CAUTION

Do not over-tension belts or drive chains.

AUTO BELT TENSIONER

The continuous drive belt is kept under constant tension by the Auto-Belt tensioner. This is set up initially at the factory and should not need attention unless the drive belt has stretched past its serviceable use, indicated when the spring finger is engaged in red area on the rack assembly.

TO REMOVE OLD BELT

1. Loosen the two nuts (A) securing the spring plate. *Fig. 25*
2. Remove the top bolt (B) from the spring plate while holding the spring plate and slowly release the tension on the spring and disengage the spring finger from rack assembly by pressing outwards. *Fig. 25*
3. Remove old belt from around pulleys and discard.

SPRING PLATE

SPRING FINGER

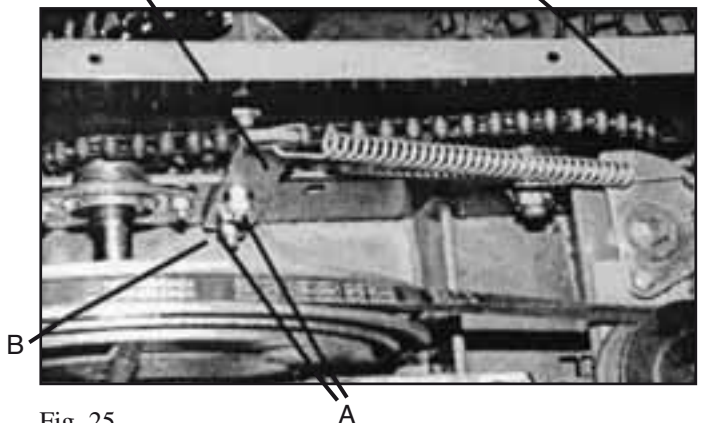


Fig. 25

MAINTENANCE

TO FIT NEW BELT

4. Ensure that the peg on rack assembly (A) engages in the front slot of cam plate assembly. (B) *Fig. 26*
5. Fit new drive belt around pulleys.
6. Draw the spring plate back into position and secure. Check that the spring finger (C) engages in the first couple of teeth on the rack assembly. *Fig. 26*

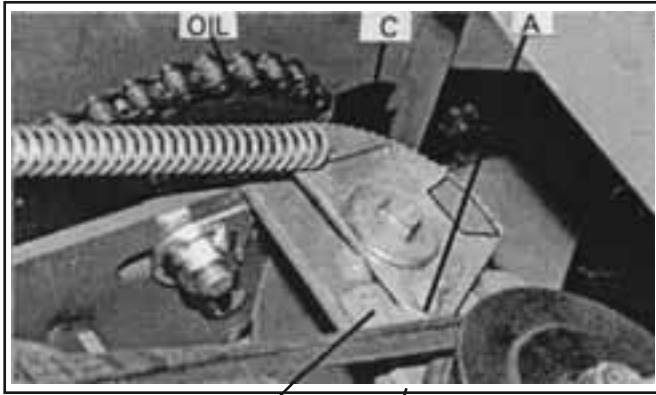


Fig. 26

If the spring finger engagement in the rack assembly is not at the start of the rack assembly, proceed as follows:-

7. Release the spring plate as per step (2)
8. Loosen the four locknuts (A) on the engine hold down bolts. *Fig. 27*
9. Loosen locknuts (B) on engine pulley guard and slide to the rear. *Fig. 27*
10. Adjust nyloc nut (C) on motor adjustment plate to move the engine to the rear and repeat step (6).
11. Re-tighten engine mounting bolts and re-position belt guard with 2-3mm clearance between belt guard and engine pulley.

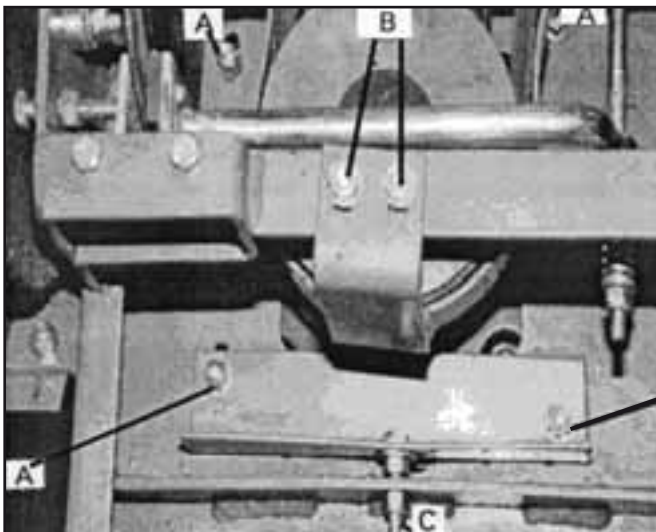


Fig. 27

NOTE:

After a period of time the drive belt will stretch past the limit of the auto-tensioner. The auto-tensioner can be reset to allow for this stretching by following the above instructions- steps (7) to (11). Re-grease the bearing area under cam plate when fitting new belt. *Fig. 26*

STEERING RODS

Should not normally require resetting.

1. Loosen the rod lock nut (A). *Fig. 11*
2. Release the fixing bolt.
3. Turn the tie rod end to adjust for length. Clockwise to shorten, anti-clockwise to lengthen.
4. Replace the fixing bolt and tighten.
5. Tighten the rod lock nut.
6. Make sure the rod is free to pivot.

CUTTER HEAD TILT

This will not normally require resetting.

1. Loosen the U-Bracket nuts (B) *Fig. 12*
2. Adjust the nuts up or down to set tilt.
3. Model 160 (760mm cut) requires the back of the blade circle tilted 15mm above the front of the blade circle in low cut position.
4. Re-tighten all nuts.

STEERING STOPS

These will not normally require resetting.

1. Check if the steering segment gear rotates in both directions.
2. Loosen the locknut on the front beam and adjust the bolt till number of turns in both directions is equal.
3. Re-tighten the Locknut.

HEIGHT OF CUT ADJUSTMENT

To adjust the height of cut rotate the nyloc nut (A) situated under the centre of machine on the rear cutterhead support assembly. Adjust the nyloc nut to obtain low cut at front of blade circle of 15mm. *Fig. 28*

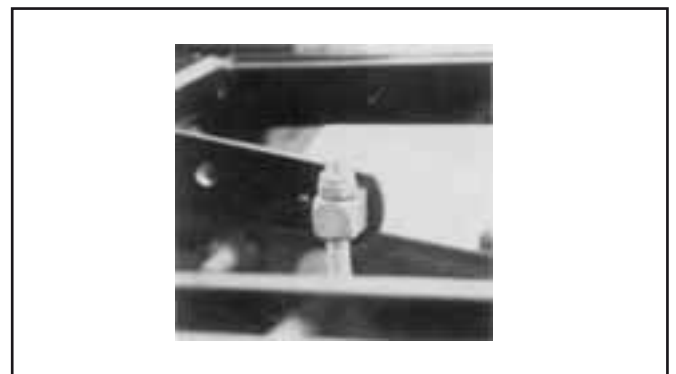



Fig. 28


SAFETY INTERLOCK SYSTEM


The safety interlock system has been designed for your protection and should not be tampered with. It gives the **Ranger** the following characteristics.

MAINTENANCE

The engine will not start unless the clutch/brake pedal is depressed and the cutter drive is disengaged.

	WARNING
	The engine will stop if the operator leaves the seat with the speed selector engaged and/ or the cutter drive engaged.

	WARNING
	If the interlock system fails, see an authorised Rover Service Dealer. Do not operate the mower until the fault is corrected.

	CAUTION
	The safety switch circuit may become defective if wet. Do not spray switches and connections.

STORAGE:

Never store the engine with fuel in tank indoors or in poor ventilated enclosures where the fuel fumes may accumulate.

If the machine is to be stored over 30 days proceed as follows:

1. Remove all fuel from the carburettor and the fuel tank to prevent varnish-like gum deposits.
2. Remove the spark plug and pour 30ml of engine oil into the cylinder. Crank the engine several times to distribute the oil. Replace the spark plug.
3. Clean the engine and cooling fins, etc., and any clippings, dirt and chaff.
4. Clean the underside of the mower and cutting unit. Paint any chips or scratches.
5. Lubricate the chassis components.
6. Remove and charge the battery and store in a cool dry spot. Recharge every 30 days.
7. Store the machine in a clean dry place.

REMOVAL FROM STORAGE

1. Change the oil
2. Fill the fuel tank with fuel
3. Check the spark plug
4. Check the drive belts
5. Check the drive chain
6. Lubricate the drive chain
7. Lubricate the pivot points
8. Grease the front axle spindles
9. Check the tyre pressure
10. Check safety interlock
11. Check cutting blades.

SAFETY SWITCH ADJUSTMENTS

Clutch Brake Pedal

1. Depress the clutch brake pedal and apply the parking brake.
2. Loosen the two safety switch retaining screws and slide the safety switch towards the rear of the mower. *Fig. 29*
3. Depress the clutch brake pedal and release the parking brake allowing the clutch brake pedal to return to its normal disengaged position.
4. Slide the safety switch towards the tab on the clutch brake shaft. Position the safety switch with a clearance of 6mm between the safety switch body and the tab.
5. Tighten the two safety switch retaining screws.

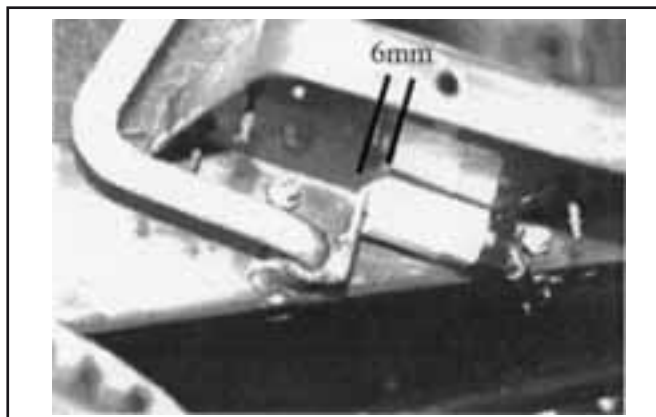


Fig. 29 Clutch brake safety switch

Cutter Engagement Safety Switch

The cutter engagement safety switch does not require any routine adjustment. It should be checked occasionally for operation, working condition and its fasteners checked for tightness.

Seat Panel Safety Switch

1. Raise the seat panel and allow it to open till it rests on the steering wheel.
2. Loosen the two safety switch retaining screws.
3. Position the safety switch to give the safety switch button 10mm of protrusion above the cowl body panel.
4. Tighten the two safety switch retaining screws.

Maintenance Chart

This maintenance chart is to be read in conjunction with the engine manufacturer's instruction manual and information in this Owner's manual

Engine	Frequency						
	Each use	First 5 hours	First 20 hours	Every 25 hours	Every 50 hours	Every 100 hours	Every 200 hours
Check oil level	x						
Change oil		Briggs	Honda		Briggs (i)	Honda (i)	
Change oil filter (if fitted)						x	
Check air filter elements	x						
Clean air filter foam element				x (ii)			
Clean air filter paper element				x (ii)			
Replace air filter paper element							x (ii)
Check air intake screen	x						
Check spark plug					x		
Replace spark plug						x	
Check battery fluid level	x						
Clean battery & terminals				x			
Replace fuel filter						x	
Ride-On							
Check safety interlocks				x			
Check cutting blades	x (iii)						
Check cutterhead brake				x			
Check disc brake				x			
Check drive belts				x			
Check tyre pressure	x						
Remove and clean under pulleys covers. 38" deck only					x		
Check for loose fasteners	x						
Lubrication points							
	Type of lubricant						
Oil jockey arm pivot		Engine oil		x			
Oil throttle cable		Engine oil		x			
Oil cutter drive lever		Engine oil		x			
Oil clutch/brake pedal		Engine oil		x			
Oil tie rod ends		Engine oil		x			
Oil drive chains		Chain oil		x			
Grease stub axles		GP grease		x			
Grease axle beam		GP grease		x			
Grease steering shafts		GP grease		x			

Notes:

- i - Change the oil every 25 hours when operating the engine under heavy load or in high temperatures refer to engine manufacturer's instruction manual for correct grade of oil.
- ii - Clean the air filter elements more often under dusty conditions or when air borne debris is present. Replace air cleaner parts, if dirty.
- iii- Always replace cuttings blades in sets to maintain balance

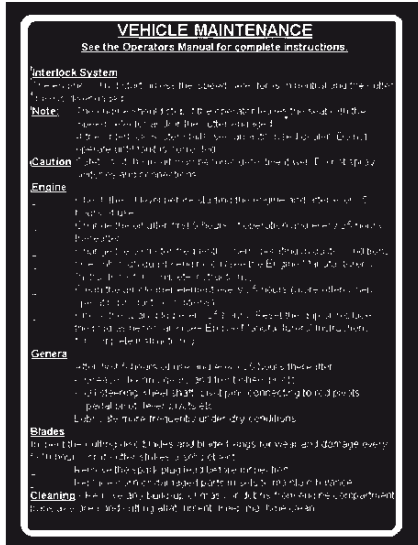
	WARNING
	Before undertaking any maintenance, cleaning or adjustments, apply the parking brake and remove the ignition key.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine loses power.	<ol style="list-style-type: none"> 1. Oil level in crank case is low. 2. Cooling fins and air passages under engine blower housing are blocked. 3. Engine load is excessive. 4. Air cleaner is dirty. 5. Dirt or water is in fuel system. 6. Carburettor is adjusted incorrectly. 7. Spark plug is pitted, fouled or defective in some other way. 	<ol style="list-style-type: none"> 1. Add oil to crankcase. 2. Remove obstruction from passages. 3. Select a lower speed to reduce load. 4. Clean air cleaner element. 5. Have machine serviced by Authorised Service Dealer. 6. Adjust the carburettor. 7. Install new correctly gapped Spark plug.
Engine over heats.	<ol style="list-style-type: none"> 1. Cooling fins and air passages under engine blower housing are Blocked. 2. Carburettor is adjusted incorrectly. 3. Oil level in crankcase is low. 4. Engine load is excessive. 	<ol style="list-style-type: none"> 1. Remove obstruction from cooling fins and air passages. 2. Adjust the carburettor. 3. Add oil to crankcase. 4. Select a lower speed to reduce load.
Mower vibrates abnormally	<ol style="list-style-type: none"> 1. Engine mounting bolts are loose. 2. Loose cutter pulley, idler pulley or drive pulley. 3. Cutter assembly is unbalanced. 4. Cutter assembly is loose. 	<ol style="list-style-type: none"> 1. Tighten mounting bolts. 2. Tighten the appropriate pulley. 3. Replace broken blades in sets. 4. Tighten securing nut.
Cutter does not rotate.	<ol style="list-style-type: none"> 1. Cutter drive belt is worn, loose or broken 2. Cutter drive belt is off pulley. 	<ol style="list-style-type: none"> 1. Install new cutter drive belt. 2. Install cutter drive belt.
Mower does not drive	<ol style="list-style-type: none"> 1. Drive belt is worn, loose or broken 2. Drive belt is off pulley. 3. Unable to select forward or reverse. 	<ol style="list-style-type: none"> 1. Install new drive belt. 2. Install drive belt. 3. Have machine serviced by Authorised Service Dealer.
Engine does not start, hard to start, loses power, or fails to keep running.	<ol style="list-style-type: none"> 1. Fuel tank is empty. 2. Speed selected. 3. Cutter Drive is engaged. 4. Spark plug is loose. 5. Spark plug lead is loose or disconnected from spark plug. 6. Spark plug gap is incorrect. 7. Spark plug is pitted, fouled or defective in some other way. 8. Wrong spark plug is used. 9. Electrical connections are loose. 10. Carburettor is adjusted incorrectly. 11. Air cleaner is dirty. 12. Vent hole in fuel tank is plugged. 13. Dirt or water in fuel system 14. Dead battery. 15. Defective Electronic Ignition System. 16. Defective Safety Switches. 	<ol style="list-style-type: none"> 1. Full fuel tank with petrol. 2. Select Neutral. 3. Disengage Cutter Drive. 4. Tighten spark plug. 5. Install spark plug lead on spark plug. 6. Set spark gap between electrodes at 0.7mm to 0.8mm 7. Install new correctly gapped spark plug. 8. Install correct spark plug. 9. Check electrical system to ensure good contact. 10. Adjust the carburettor. 11. Clean the air cleaner element. 12. Inspect and open vent. 13. Have machine serviced by Authorised Service Dealer.
Engine does not idle or idles poorly.	<ol style="list-style-type: none"> 1. Air cleaner is dirty. 2. Oil level in crankcase is low. 3. Cooling fins and air passages under engine blower housing are plugged. 4. Idle speed is too low or high. 5. Dirt or water is in fuel system. 6. Vent hole in fuel tank is plugged. 7. Spark plug is pitted fouled or defective in some other way. 	<ol style="list-style-type: none"> 1. Clean air cleaner element. 2. Add oil to crankcase. 3. Remove obstruction from cooling fins and air passages. 4. Adjust the carburettor. 5. Have machine serviced by Authorised Service Dealer. 6. Clean fuel tank vent. 7. Install new correctly gapped spark plug.

SAFETY AND INSTRUCTION DECALS

Safety and Instruction decals that are mounted on the RANGER Rear Engine Ride On Mower. Replace any that become damaged or illegible.



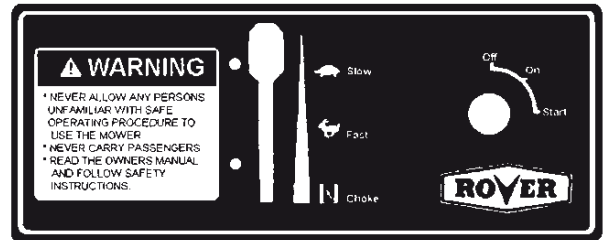
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P/N A02571



P/N A12019



P/N A12261



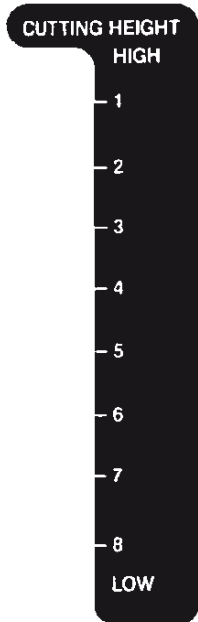
P/N A12767



P/N A12106



P/N A05417



P/N A06379

OPERATOR INSTRUCTIONS

To start the engine

1. Depress the clutch/brake pedal
2. Move the drive selector to the neutral position.
3. Disengage the cutter drive lever
4. Move the throttle lever to choke position.
5. Turn the ignition key to the start position and release when the engine starts.

To drive or mow

1. Depress the clutch/brake pedal.
2. Move the throttle lever to the fast position.
3. Engage the cutter drive lever and select the height of cut.
4. Select the desired speed to suit conditions.
5. Slowly release the clutch/brake pedal.

To stop the engine

1. Depress the clutch/brake pedal.
2. Apply the parking brake.
3. Disengage the cutter drive.
4. Move the speed selector to neutral.
5. Move the throttle lever to the slow position.
6. Turn the ignition key to off, and remove the key.

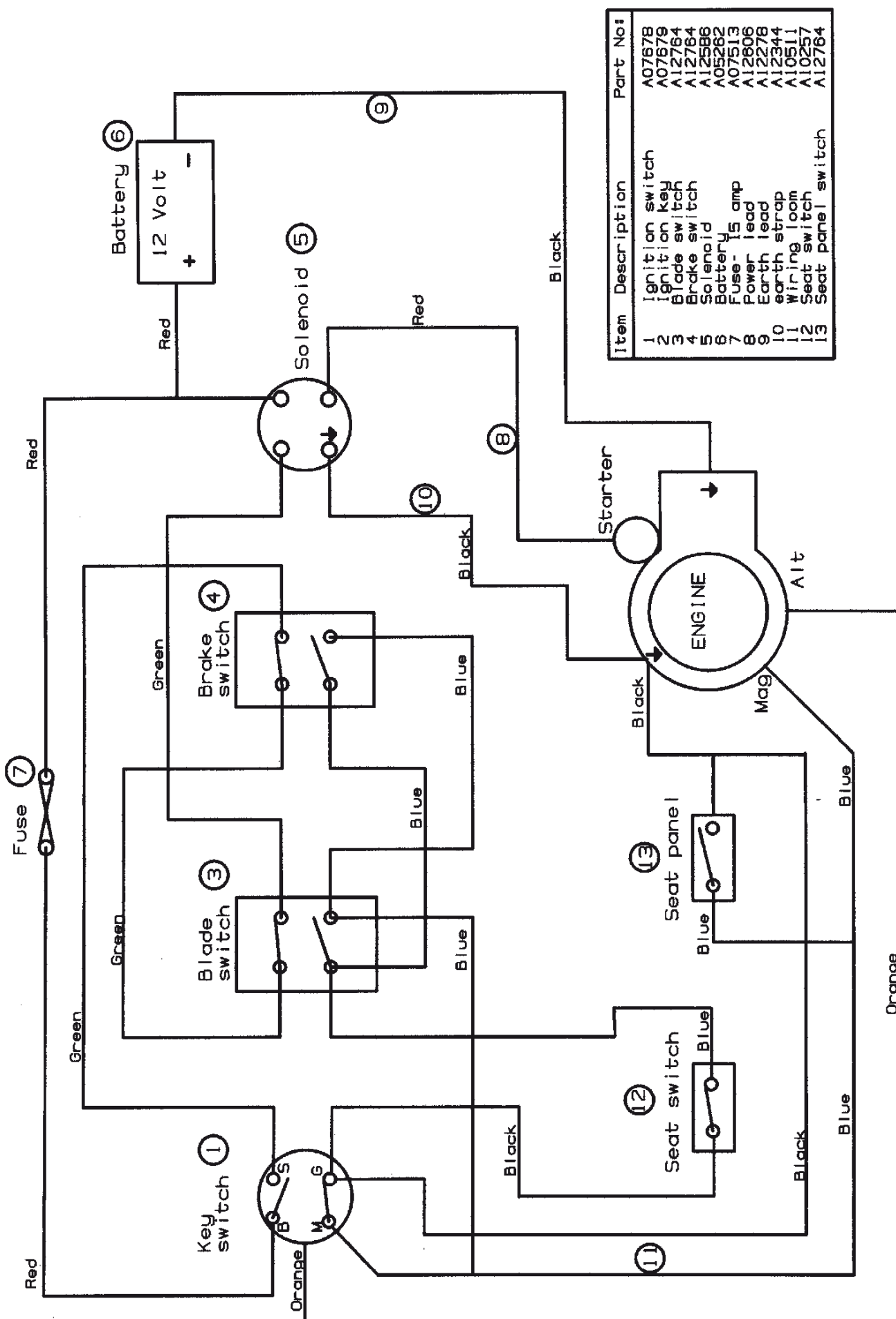


**READ AND UNDERSTAND THE OWNERS MANUAL BEFORE OPERATING THE MOWER.
IF THESE WARNINGS ARE NOT FOLLOWED PERSONAL INJURY MAY OCCUR.**

Rover Mowers Limited.

P/N A16374

CIRCUIT DIAGRAM AND SPARES



Item	Description	Part No.
1	Ignition switch	A07678
2	Ignition key	A07679
3	Blade switch	A12764
4	Brake switch	A12764
5	Solenoid	A12586
6	Battery	A05262
7	Fuse-15 amp	A07513
8	Power lead	A12806
9	Earth lead	A12278
10	earth strap	A12344
11	Wiring loom	A0511
12	Seat switch	A10257
13	Seat panel switch	A12764

SPV- 42 Sheet: 6
 Rev. A 7 April 2004
 Model: Ranger Auto Drive
 Page:

Electrical schematic- model 53179 Ranger 10.5 Hp IC AVS

SAFETY INSTRUCTIONS



This product is manufactured to comply with Australian Safety Standards. If non-genuine replacement parts; including blades; are fitted to this product it may no longer meet that Australian Safety Standard and Rover Mowers Warranty. The fitting of non-genuine replacement parts could result in serious injury, and, or machine malfunctioning which may result in litigation against the person or persons responsible for the alterations.

- * Know your controls. Read the owner's manual carefully. Learn how to stop the engine quickly in an emergency.
- * Do not allow children or people unfamiliar with these instructions to use the mower. Do not carry passengers.
- * Make sure the lawn is clear of sticks, stones, bones, wire and debris. They could be thrown by the blade.
- * Do not mow whilst people, especially children, or pets are in the mowing area.
- * Never mow across the face of the slope, unless the mower is designed for this purpose.
- * Exercise extreme caution when on slopes. Reduce speed on slopes and in sharp turns to prevent overturning or loss of control. Do not stop or start suddenly when going uphill or downhill.
- * Stay Alert for holes in the terrain and other hidden hazards. Use care when pulling loads or using heavy equipment
 - (a) use only approved drawbar hitch points
 - (b) limit loads to those you can safely control
 - (c) do not turn sharply
 - (d) use care when backing up, and
 - (e) use counterweight(s) or wheel weights when suggested in the owner's manual.
- * Watch out for traffic when crossing or operating the mower near roadways
- * Stop the blades rotating before crossing surfaces other than grass.
- * When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while it is in operation.
- * Before leaving the operator's position –
 - (a) disengage all clutches and secure cutting units
 - (b) change into neutral and set the parking brake, and
 - (c) stop the engine and remove the key.
- * Stop the engine and disengage drive to attachments –
 - (a) before refuelling
 - (b) before removing grass-catcher/ catchers
 - (c) before making height adjustment unless adjustment can be made from the operator's position
 - (d) before clearing blockages
 - (e) before checking, cleaning or working on the mower
 - (f) after striking a foreign object (inspect the mower for damage and make repairs before restarting and operating the equipment) and
 - (g) if machine starts to vibrate abnormally (check immediately)
- * Disengage drive to attachments when transporting or not in use.
- * A mower operator should be in good physical and mental health and not under the influence of any drug or alcohol which might impair vision, co-ordination or judgement.
- * Never mow while barefoot or wearing open sandals, or

things. Wear long trousers and heavy shoes.

- * It is advisable to wear suitable eye protection when operating a mower.
- * Mow only in good daylight.
- * Before using, always visually inspect to see that blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.

DAMAGED BLADES AND WORN BOLTS ARE MAJOR HAZARDS

- * Check all nuts, bolts and screws often, always be sure the mower is in safe operating condition.
- * Keep safety devices (guards and switches) in place and in working order.
- * Never use the mower unless the grass catcher, or guards provided by the manufacturer, are in position.
- * Ensure any spare parts used comply with the original manufacturer's recommendations and specifications.
- * Replace worn or faulty silencers.
- * Keep engine free of grass, leaves or excessive grease. These can be a fire hazard.
- * Refuel outdoors only. Do not smoke while fueling the engine. Never remove the cap of the fuel tank or add petrol while the engine is running or the engine is hot. Remove fuel cap slowly to relieve any tank pressure. If petrol is spilled, do not attempt to start the engine but move machine away from the area of the spill and avoid creating any source of ignition until petrol vapours have dissipated.
- * Check for fuel leaks while refuelling or using the mower. If a fuel leak is found, do not start or run the engine until the fuel leak is fixed and spilled fuel is wiped away.
- * Do not operate the engine in a confined space where exhaust fumes (carbon monoxide) can collect.
- * Always mount the mower on the opposite side of the discharge chute.
- * Start the engine carefully with the cutting means disengaged.
- * Do not over-speed the engine or alter governor settings. Excessive speed is dangerous and shortens mower life.
- * Stop the engine whenever you leave the mower, even for a moment.
- * Store the mower in a well-ventilated room away from naked flames such as may be found in hot water heaters.
- * Do not lend or sell the mower without the Owner's Manual.



WARNING

If fitted with accessories, including any authorised Rover accessories such as Grass Catcher, this mower may not comply with AS 3792.1

Warranty Conditions

AUSTRALIA & NEW ZEALAND ONLY

Rover Mowers Limited warrant that this machine is free from defects in material and workmanship. This warranty is limited to making good or replacing any part which appears upon inspection by the manufacturer or his agent to be defective in material or workmanship.

The engine used to power this machine is warranted by the manufacturer whose warranty statement has been included with the machine. As the warranty for the engine may differ from the warranty for the other components, you are advised to read the engine manufacturer's warranty carefully.

For other items this warranty shall apply for a period of 12 months from the date of purchase except for products used commercially where the warranty is limited to 90 days.

This warranty does not obligate the manufacturer, his agents or dealers to bear the transport costs incurred in the repair or replacement of any defective part.

This warranty excludes fair wear and tear, or any damage caused by misuse or abuse. Parts such as blades, blade bolts, v-belts and spark plugs, which can be subjected to use beyond their normal intended working capacity are also excluded.

This warranty is void if parts other than genuine have been used or if repairs or alterations have been made without the manufacturer's written authority.

The above warranty does not exclude any condition or warranty implied by the Trade Practices Act 1974 or any other relevant legislation which implies any condition which cannot be excluded.

EXTENDED WARRANTY: For domestic use only, a 24 month extended warranty applies. It requires the customer to complete the '2 year warranty registration card', and forward along with a copy of the cash register receipt to "Warranty, Rover Mowers Limited", Normal warranty exclusions as listed still apply.

REMEMBER:
PROOF OF PURCHASE IS THE RESPONSIBILITY OF THE OWNER AND IS NECESSARY PRIOR TO WARRANTY WORK BEING UNDERTAKEN. REPAIRS MUST BE CARRIED OUT BY AN AUTHORISED ROVER DEALER /SERVICE AGENT AND GENUINE SPARE PARTS MUST BE USED OR YOUR WARRANTY WILL BE VOID.

Online warranty registration - www.rovermowers.com.au

For your record:

Dealer's Name:

Dealer's Address:

Dealer's Phone No:

Product Model No:

Product Serial No:

Date of Purchase:



Quality
Endorsed
Company

ISO 9001 Lic 10168
Standards Australia

Rover Mowers Limited reserves the right to make changes of and add improvements upon its product at any time without notice or obligation. The Company also reserves the right to discontinue manufacture of any product at its discretion at any time.

ROVER
Mowers Limited

A.B.N. 11 000 257 303



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